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Obviously, Ricardo's experiment is a unique experiment set up to prove the differences between initial and main phases of combustion in an engine; according to his experiment, a variation in the velocity state of the engine influences only the duration of the main phase and leaves the duration of the first phase unchanged. But, as we shall see, the arrangement followed in Ricardo's experiment involved a theoretical error (error in principle) which deprives this experiment of its worth. Regrettably enough, later research also lacked data that could permit solution of the problem concerning the reality of the separation of the combustion process in an engine into phases with mechanisms that differ in principle.

At the basis of all research of this type there are, along with the individual errors in procedure and method, two general defects in principle: either the combustion process is considered as a whole; or, in a comparison of the course of combustion in the individual phases, the constancy of the physicochemical and gas-dynamical conditions is not guaranteed. (In the experiments of Bouchard, et al., the preheating of the mixture at the intake was absent and thus there was no assurance of the conditions necessary for the volatilization of the fuel and mixture-formation.) For example, the performance of the experiments for various mixture compositions, fuels, RPM, etc., for constant "ignition-advance" provides for comparable physical conditions only for the initial phase of combustion (or burning), and makes the gas-dynamical conditions completely incomparable for combustion in the main phase, since its beginning ("origin") must exist at different points as the states of the charge changes in motion.

Therefore, the investigation of combustion speed in the separate individual phases of a process which holds special interest for us is that in which constant physicochemical and gas-dynamical conditions might be assured. Such an investigation is the main problem of this article.

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